

ABSTRACT OF THE DISCLOSURE

A magnetoresistive element includes a magnetoresistive film having a magnetization pinned layer, a magnetization free layer, and a nonmagnetic intermediate layer. A magnetization direction of the magnetization pinned layer is substantially fixed in an external magnetic field, a magnetization direction of the magnetization free layer is configured to change in the external magnetic field, and the nonmagnetic intermediate layer formed between the magnetization pinned layer and the magnetization free layer and has a stacked structure of a first non-metallic intermediate layer/a metal intermediate layer/a second non-metallic intermediate layer. The magnetoresistive element also includes a pair of electrodes coupled to the magnetoresistive film and is configured to provide a current in a direction substantially perpendicular to a surface of the magnetoresistive film.